CLAIM AMENDMENTS

Please amend the claims to read as follows:

1.-17. (Canceled).

18. (Original) Apparatus for producing as outputs synthetic values of at least one geophysical

parameter for a well in response to inputs of actual values of geophysical parameters measured in

the well, comprising a neural network ensemble selected by:

training a set of individual neural networks to produce one or more synthetic output

values of at least one geophysical parameter for a well in response to a plurality of inputs of

actual values of geophysical parameters measured in the well, and

using a genetic algorithm having a multi-objective fitness function to select at least one

ensemble, comprising a subset of the set of individual neural networks, having a desirable fitness

function value.

19. (Original) Apparatus according to Claim 18, wherein the fitness function comprises a

negative error correlation objective.

20. (Original) Apparatus according to Claim 18, wherein each ensemble comprises five

individual neural networks.

21. (Previously presented) Apparatus according to Claim 18, wherein the neural network ensemble is further selected by using the genetic algorithm to select a group of ensembles having desirable fitness function values.

22. (Previously presented) Apparatus according to Claim 21, wherein the neural network ensemble is further selected by testing one or more of the ensembles from the group of ensembles with data comprising actual input values and output values.

23. (Original) Apparatus according to Claim 18, wherein each member of the set of neural networks has diverse initial parameters.

24. (Original) Apparatus according to Claim 23 wherein each member of the set of neural networks has a different number of hidden nodes.

25. (Original) Apparatus according to Claim 24, wherein the set of neural networks comprises thirty-two neural networks.

26. (Original) Apparatus according to Claim 25, wherein the neural networks have from five to thirty-six hidden nodes.

27. (Original) Apparatus according to Claim 18, wherein the multi-objective function includes an ensemble mean squared error objective.

28. (Original) Apparatus according to Claim 18, wherein the multi-objective function includes a sum squared weights objective.

29. (Original) Apparatus according to Claim 18, wherein the individual neural networks are trained to produce as outputs predicted open hole logging parameters in response to inputs comprising pulsed neutron logging parameters.

30. (Previously presented) Apparatus according to Claim 18, wherein the neural network ensemble is further selected by selecting a weighting factor for each objective of the multi-objective function.

31. (Previously presented) Apparatus according to Claim 30, wherein the neural network ensemble is further selected by using a genetic algorithm to select the weighting factors.

32. (Previously presented) A method for producing synthetic open hole logs from actual pulsed neutron logs, comprising:

      receiving log data from a pulsed neutron logging tool; and

      generating synthetic open hole logs from the received log data using a neural network ensemble selected from a set of individual networks by a genetic algorithm having a multi-objective fitness function.

33. (Original) A method according to Claim 32 wherein the multi-objective function comprises a negative error correlation objective.

34. (Previously presented) A method for generating a neural network ensemble for processing pulsed neutron well log data, comprising:

 training a set of individual neural networks to produce one or more output values in response to pulsed neutron well log input data, and

 using a genetic algorithm having a multi-objective fitness function to select at least one ensemble, comprising a subset of the set of individual neural networks, having a desirable fitness function value.

35. (Original) A method according to Claim 34, wherein the fitness function comprises a negative error correlation objective.